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ABSTRACT

Historically, handicapped people have been caught in a job trap. Statistics of selected groups of handicapped people indicate a history of unemployment, underemployment, lack of job satisfaction and frustration. Even when professional training is introduced handicapped people generally receive lower wages than their non-handicapped peers. If this history is to be reversed then new approaches must be attempted in the rehabilitation process. The systems model represents one viable approach. With an understanding of the history of unemployment and underemployment of deaf people, the National Technical Institute for the Deaf (NTID) has developed its programs and services utilizing the systems model. The major components of the NTID educational system are defined and described, including the concept of accountability. The importance of feedback and program flexibility are highlighted. Three basic principles are inherent in the system: (1) the program must be a vital, dynamic, organized whole; (2) it should be behaviorally oriented and quantifiable, if possible; and (3) beginning and on-going documentation is mandatory. (Author/TA)

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TITLE: THE SYSTEMS APPROACH IN THE REHABILITATIVE PROCESS

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This program will present the systems approach as a model for use in the rehabilitative process. Mr. William Williams will present a working definition of the systems approach. Dr. Clarcq will describe the National Technical Institute for the Deaf and its relationship to the systems approach in terms of the need for the program, NTID objectives, nature of the NTID student admission process and a description of the evaluation and diagnostic phases of the program. Dr. Collins will present a description of an analysis of the NTID educational support service and research and training units and describe the role of accountability, feedback and program flexibility in the NTID system.

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Educational Systems

In a Medieval university three professors attempted to determine the number of teeth in a horse's mouth. They agreed that it could not be three or multiple thereof, because that would be an afront

to the Holy Trinity. They also agreed that it could not be a multiple of seven because the earth was made in six days, and He rested on the seventh - what then? A student, overhearing the discussion, walked over to the horse and to the horror of the professors opened the horse's mouth and counted its teeth. Thus began a rebirth of a scientific method of inquiry and somewhere Aristotle smiled.

New, enormous challenges; a multitude of resources; and a concern for people now necessitate a humanistic, scientific method of problem solving and organizational development. It took man 45,000 years to go from caves to communicating with pictures; less than 50 years to go from Kitty Hawk to space flight; and less than 10 years to go from space flight to the Moon. The need is clearly for a method of keeping abreast of all the resources available to us, and from the mother of invention comes systems and the systems approach.

The purpose of this paper is to present a working definition of "system" and to delineate six basic steps in the systems approach in such a way that the administrator in education, rehabilitation, and welfare can understand how he may implement it.

Dr. Jack R. Clarcq
(see above for address)

The National Technical Institute for the Deaf - Example of an Educational System for the Disadvantaged

The National Technical Institute for the Deaf is the first large scale endeavor in the world to educate deaf students at the post-secondary level within a predominately hearing college community. NTID recognizes the need to provide deaf citizens an opportunity for post-secondary education and training.

NTID is a multi-purpose institute for the deaf. It is an educational center; a service center that prepares students for successful job placement and community living; a training and practicum center assisting in developing professionals to serve the deaf; and a research and demonstration center to help improve education of the deaf in general and to enhance the economic accommodation of deaf people nationally.

NTID has as its basic objective providing deaf students with technical, personal and social competences leading to job satisfaction and effective participation in American society.

NTID's recruitment program has developed appropriate relationships with among others vocational rehabilitation services. In the admissions process the above assist NTID in identifying applicants who appear able to benefit from NTID's educational programs and support services.

The first phase of the students experience is in the Vestibule Program, which varies in length according to individual needs. The Vestibule Program provides students with program sampling designed to provide students with exposure to academic programs. Program sampling combines hands on experiences, career seminars and field trips. Students are also

exposed to personal development seminars, physical education programs, and evaluative programs in math, science and English.

At the conclusion of the Vestibule Program, each student's achievements, aptitudes and interests are analyzed and the student is assisted in selecting a study program at the Certificate, Diploma, Associate or Baccalaurate level. A contract is written to give each student a definite career goal and an understanding of what must be accomplished to meet that goal.

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Programs and Accountability at the National Technical Institute for the Deaf

Following completion of the Vestibule experience a student may enter any one of the three technical educational programs administered directly by NTID or into a baccalaureate degree program of the Rochester Institute of Technology. The three technical education programs of NTID are: 1) Certificate programs, which typically take two to three quarters to complete and lead to direct employment; 2) Diploma programs, which have more depth and theory than the Certificate programs and which usually require three to six quarters to complete; and 3) Associate Degree Programs, which are comparable to the same programs offered in typical community colleges and require approximately eight quarters to complete. A student may enter a degree program at any of the various colleges which comprise RIT. A high degree of flexibility is maintained and it is possible for a student to alter his goals to a higher level of study at any point.

The educational disadvantage of the deaf population and an institutional commitment to minimal attrition requires the utilization of extensive support services. These support services include:

Educational support - tutoring, notetaking, and services of interpreters (sign language).

Personal counseling - required individual counseling, voluntary group counseling, enrollment in Personal Development Seminars.

Social and Cultural Development - participation in the ongoing social and cultural activities of hearing peers, and in programs specifically designed to obviate the effects of deafness.

Career Development - Seminars on application, interviewing and holding a job. Cooperative placement is part of the educational experience and placement services are provided to all graduates.

A systems approach is utilized by all staff members and programs. Accountability is built into all aspects of the program in order to reveal weaknesses or deficienceis. It is therefore possible for the program to be improved continually in order for better services to provide the student.

LENGTH OF PROGRAM: 1 1/4 hours

AUDIOVISUAL REQUIREMENTS:

This program will be heavily mediated and will not be a program where the speakers will read papers. Rather each participant will present his material via a media approach. Need for slide projector (2" x 2") and an overhead projector. A remote control will be needed for the slide projector so that it can be operated from the speakers table.

Systems Fundamentals

By

William H. Williams

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Once upon a time the animals decided they must do something heroic to meet the problems of a "new world", so they organized a school. They adopted an activity curriculum consisting of running, climbing, swimming, and flying; and to make it easier to administer, all the animals took all the subjects.

The duck was excellent in swimming, better in fact than his instructor, and made passing grades in flying, but he was very poor in running. Since he was slow in running, he had to stay after school and drop swimming to practice running. This was kept up until his web feet were badly worn, and he was only average in swimming. But average was acceptable in school, so nobody worried about that except the duck.

The rabbit started at the top of the class in running but had a nervous breakdown because of so much make-up work in swimming.

The squirrel was excellent in climbing until he developed frustration in the flying class, where his teacher made him start from the ground up instead of the tree-top down. He also developed charlie horses from overexertion which got him a C in climbing and a D in running.

The eagle was a problem child and was disciplined severely. In the climbing class, he beat all the others to the top of the tree but insisted on using his own way to get there.

At the end of the year, an abnormal eel that could swim exceedingly well and also run, climb. and fly a little had the higest average and was valedictorian.

The prairie dogs stayed out of school and fought the tax levy because the administration would not add digging and burrowing to the curriculum. They apprenticed their child to a badger and later joined the groundhogs and gophers to start a successful private school.

That is one way to develop a program (school, curriculum, system, etc.). This paper takes an in-depth look at an alternative method and uses as an example of the alternative method, a counseling program developed and currently in use at the National Technical Institute for the Deaf (NTID) at Rochester Institute of Technology in Rochester, New York.

To begin with, the program developed at NTID was designed with three basic principles in mind: the program must be organic; objective oriented; and documented.

The program developed must be organic. Although this word has many meanings to a variety of people depending upon their disciplines, used in this context it refers to a vital, dynamic, organized whole.

The program developed must be objective oriented. When the program being developed is educational in nature, the objectives, if at all possible, should be behavioral. They should also be quantifiable if possible. With regard to these last two sentences, the words "if possible" should not be used as roots of escape for those defining objectives. Most programs can and certainly should have behavioral, quantifiable objectives. Where they cannot or where the establishment of objectives which are behavioral and quantifiable would require effort which is econmically unfeasible, other objectives should be written.

The program should be documented. A program which exists in someone's mind exists only there. Beginning and on-going documentation of a program is mandatory.

Added to these three basic principles of organic, objective orientation, and documentation is an axiom: people without these programs are limited but, these programs without people are useless. It must never be forgotten that programs are developed for people and, that when they cease to serve people they are not functioning as they were intended.

From the above three basic principles a definition can be written for the program to be developed: *A program is a documented, organic collection of things united to accomplish a specific objective. The work "things" in this definition refer to the elements of a program:* input, output, operations, and resources. The function of the program is to take the input through a series of operations utilizing whatever resources are required to achieve the desired output.

One way in which these four elements might be used relates to curriculum planning. One might refer to a student's intelligence, reading ability, and interest as input; the student's terminal behavior as output; the personnel, media, textbooks, and tests, as well as other things available to the curriculum planner or instructor as resources; and the course, itself, or the procedures, processes, and methods used to apply to the resources in taking the student from input to output as the operations.

A highly significant element thus far ommitted from the elements delineated so far, is feedback. It is feedback that provides ongoing evaluation making the program organic. Although feedback takes its primary input from output, it extracts data from all four elements and feeds back to those elements. Feedback looks at the entire program from start through operations to finish and makes it a dynamic process through self-evaluation.

Six key steps are required in the development of such a program as described above.

The first step is to establish need for the result (or output) of the program to be designed. It is this step which establishes the raison d'etre for the program.

The second step is to define objectives. It is this step which determines the requirements for the program; specifically what is to be accomplished, what will be the beginning, and what resources will be available.

The third step is to determine how requirements or objectives will be met. It is in this step that alternative methods are evaluated and basic solutions to the requirements of the objectives are decided upon. This is also the step at which performance criteria are established which enable the program developers to know when they have accomplished their objectives.

The fourth step is to actually develop the program details. Such things as content, strategy, and media are determined at this point. It is important that these details tie back to the performance criteria and the objectives established in prior steps.

In step five, the program is implemented. This implementation often begins with a test-run followed by an actual run if the performance criteria are met. It is important at this time to be sure to allow for change and be sure to control the process. Controlled change must be encouraged if the program designed is to make use of feedback data and to remain organic.

The final step is a monitoring of feedback data. This is the ongoing step which enables the program to be self-evaluating and changing as required. This is a step which, if properly implemented, makes the program a dynamic thing as opposed to one which may stagnate. All things, from the very need for the program itself, to the final step of follow-up, may be changed according to the feedback data collected.

Conscientious application of these six steps will produce a documented, organic, objective oriented program which will serve both the student and teacher or client and counselor.

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PROGRAMS and ACCOUNTABILITY at the NATIONAL TECHNICAL INSTITUTE FOR THE DEAF

James L. Collins, Ph.D.
Assistant Dean for Developmental Education
NTID

Following completion of the Vestibule experience, a student may enter any one of the technical education programs administered directly by the National Technical Institute for the Deaf or into one of the baccalaureate degree programs of the Rochester Institute of Technology. The technical education programs of NTID will be described first.

Three different levels of technical education are available to deaf students in the NTID program. The first level of these programs is entitled, "Certificate Programs." These programs typically require two to three quarters for completion and lead to direct employment. Programs of this short duration are designed to equip the deaf student with basic skills for finding technical employment and include a minimum of theory in the curriculum. Programs at the certificate level are available in:

Business Technologies

Office Practice and Procedures

Data Processing

Accounting Technology

Mechanical-Electrical Technologies

Basic Technical Drafting

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Technical Science

Histologic Technicians

Physician's Office Technician

Visual Communication Technologies

Applied Photography

Diploma Programs are available to deaf students and usually require three to six quarters of study for completion. These programs are designed for occupational areas that require somewhat more theoretical emphasis and/or learning time than certificate level programs. Diploma programs are also designed for direct employment in vocational areas which offer the promise of rewarding careers for deaf graduates. At the diploma level, students may study:

Business Technologies

Office Practice and Procedures

Data Processing

Accounting Technology

Mechanical-Electrical Technologies

Architectural Drafting

Machine Tool Operation

Mechanical Drafting

Numerical Control Programming

Electronics

Technical Science

Hematology Assistant

Microbiology Assistant

Clinical Chemistry Assistant

Medical Record Technician

Visual Communication Technologies

Graphic Communications

Interior and Window Display

Textile Design

Applied Photography

The third and highest level of the programs available within NTID are the Associate Degree Programs. Associate Degrees are available to deaf students at NTID, much the same as they are to hearing students in community colleges and junior colleges throughout the country. These programs typically require seven to eight quarters of study. The following programs are available at the Associate Degree level:

Business Technologies

Office Practice and Procedures

Data Processing

Accounting Technology

Mechanical-Electrical Technology

Architectural Technology

Civil Technology

Technical Science

Medical Records Technician

Medical Laboratory Technician

Visual Communication Technologies

Applied Photography

In order to most effectively serve the interests of deaf students, flexibility is a watchword. Students are able to enter and exit at a variety of points, depending upon their desires, needs, performance and development while enrolled at the institute. Thus, for example, a student may initially be interested in a certificate level program, but with success in that program, and a broadening of maturity, coupled with heightened motivation, aspiration, and commitment to studies he may progress to a higher level program including the baccalaureate degree programs to be described below.

The curricula of the Certificate-Diploma-Associate Degree Programs are developed and taught by the staff of NTID. Special teaching techniques, such as the use of speech and manual communication simultaneously, and a heavy reliance on the visual mode of communication/instruction are part of the repertoire of this staff.

Although baccalaureate degrees are not awarded by NTID, the opportunity to pursue such degrees is available to deaf students through the Rochester Institute of Technology. Approx-

imately one third of all the deaf students enrolled at NTID are now pursuing baccalaureate degree programs. They are able to select majors in:

College of Business

College of Fine and Applied Arts

College of Graphic Arts and Photography

College of Science

College of Engineering

College of General Studies

Students who are not baccalaureate degree candidates, but rather are enrolled in Vestibule, Certificate-Diploma-Associate Degree programs also have the option of cross-registration. By doing so they may be enrolled in selected baccalaureate level courses as a means of increasing their over-all educational level and also their employment capabilities.

The educational disadvantages and resulting deficiencies which are highly correlated with deafness, coupled with NTID's commitment to a low rate of attrition means that intensive and non-traditional techniques must be utilized so that students can benefit from their educational opportunities. A variety of support programs have been developed to meet the needs of the students and to raise the probability of their successful completion of an academic program and the successful performance of a job.

Students who are enrolled in baccalaureate programs attend classes with normally hearing peers. Although some of the instructors have been oriented to the educational handicap of deafness and a few of them are minimally proficient in the language of signs, these instructors as a group are not equipped to fully provide for the educational needs of deaf students. Therefore, support services are provided by NTID staff attached to the various colleges at the Rochester Institute of Technology.

Deaf students who do not have sufficient residual hearing nor the speech-reading ability to follow the lecture of an instructor, and this includes a large number of students, are provided with interpreting services by staff members. A person skilled in the use of the language of signs to the point where he can interpret spoken English into the language of signs and the language of signs back into spoken English is provided for deaf students in the baccalaureate classes. He places himself in the front of the room and provides an on-going translation of the events which transpire in the classroom.

Specially designed notebooks and pressure sensitive paper are utilized for notetaking by some of the normally hearing students in classes which deaf students attend. Since deaf students cannot watch the instructor and/or the interpreter and write class notes at the same time, it is necessary that the deaf student be provided class notes from another source. Arrangements are made for normally hearing volunteers to make multiple copies of their notes via the pressure sensitive paper so that the deaf student will have class notes available to him.

NTID staff are assigned to each of the colleges to oversee the interpreting and notetaking operations, to provide for tutoring, intensive academic advisement, and to take any other appropriate measures to assist deaf students in the completion of their program. In the Certificate-Diploma-Associate Programs the instructors and other staff provide the same kinds of services as have been outlined in the baccalaureate programs. However, the staff which teaches in Certificate-Diploma-Associate level programs are proficient in various modes of communication, or oriented toward a visual presentation of material, and are expected to provide the tutoring and academic advisement which is necessary for the students.

All deaf students are assigned a counseling specialist as a matter of routine. The counseling specialist has the responsibility for overseeing the personal counseling of the student. It is to be expected, of course, in any population of this age that problems and concerns related to adjustment, career selection, academic success and other factors will be found. This is heightened in a population of young deaf students, because of their experiential and informational deficiencies. The personal counselors work closely with the academic staff and consider their task to be one of development of the student's potential rather than a repair or reconstruction of a damaged individual. The social and cultural development of deaf students and monitored and programmatic steps have been taken to assure the highest possible level of social and cultural development. Liaison

is maintained with the normally hearing staff and student body at the college in order to keep deaf students informed of the on-going social and cultural activities of the campus. In addition to this, specific programs are developed to meet needs which are related to the students' deafness. Examples of these programs of this would be sex information programs, information on drugs, visiting lectures and demonstrations by deaf actors, and other related activities.

Career development is an important aspect of the program at NTID. Students are enrolled in seminars and given other experiences related to career selection, appropriate job behaviors, the application process, the interviewing process and factors which make for success in holding a job and winning promotion. Cooperative work experience will be provided for as many students as is feasible. Because NTID is still in its early stages of development enough experience has not been accumulated to know whether this will be feasible. Assistance is provided to students in obtaining graduate placement and the institute feels the responsibility to provide continuing career development assistance to our students.

The communication abilities of the student body as a whole are deficient. Speech services and audiological services are available to all of our students. In addition to this, deaf students are able to upgrade their ability in the language of signs and fingerspelling if they so desire.

A primary reason for the use of a systemmatic (scientific) approach to any problem or tasks is to be able to know how near to 100% effectiveness our efforts have brought us. Analyzing the results of our efforts when simple tasks, such as sinking of a putt or throwing a baseball, are relatively easy matters. When more complicated endeavors are undertaken the analysis of effectiveness becomes increasingly complex.

Accountability has come to be a trigger word in education and the other helping professions. However, when the term "accountability" is used appropriately and without malice it means simply an accounting for the results of our efforts. Webster's New Collegiate Dictionary lists two definitions for accountable. The first is "liable to be called to account; answerable". The second definition given is "capable of being accounted for; explicable." A synonym for accountable listed in the same dictionary is "responsible." All too often the first meaning of this word and the connotation attached to it are used when we speak of accountability in the helping professions. However, if accountability is used to define; (1,) which of our efforts move us toward our goal (2,) which of our efforts did not move us toward our goall (3,) which of our efforts detracted from movement toward our goal, the true sense of the term and its value becomes apparent.

As was mentioned above the positive aspects of accountability are at times overlooked and a punitive connotation placed on a term when it is used in educational, rehabilitative or counseling

context. In business, an accountant is feared only if someone is doing something he should not be. In large business endeavors, an accounting section is necessary in order to keep one unwise or unprofitable operation from bankrupting or seriously impeding the success of an entire organization.

Education, rehabilitation and counseling are now large business endeavors. It is the responsibility of these professions to be accountable for the results of their efforts. This will insure that successful efforts will be exploited while unsuccessful ones will be dropped. At the National Technical Institute for the Deaf each operating unit is considered to be accountable for developing social and/or technical competence in each student it has contact with. By design a system of accountability has been built into the program. We are hopeful that these efforts will guide us as nearly as possible toward the ultimate goal of 100% effectiveness in the educational and rehabilitative process with our student body.

Presented at the American Personnel and Guidance Association Convention, April 5, 1971, Atlantic City, New Jersey.

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THE NATIONAL TECHNICAL INSTITUTE FOR THE DEAF

AN EDUCATIONAL SYSTEM

BY

Jack R. Clarcq

Assistant Dean for Technical Education
National Technical Institute for the Deaf

The National Technical Institute for the Deaf (NTID) was signed into law by President, Lyndon B. Johnson in June of 1965 as the first large scale endeavor in the world to educate deaf students at a post-secondary level within a predominantly hearing college community. The primary objective of NTID is to provide deaf students an opportunity for post-secondary education and training that will enable them to develop technical and social competencies necessary for a) job entry and mobility, b) community participation, c) continued education and d) economic, vocational and personal fulfillment.

There is a need for NTID to organize as an educational system. The two compelling factors which make it necessary for NTID to organize as a educational system are the unique needs of the students or clientele served and the history of unemployment, underemployment and job frustration that has been a part of the life of many deaf persons. Deaf students come to NTID with depressed academic achievement levels particularly in the areas related to language development. In addition, the usual deaf student has limited vocational awareness. However, it should be pointed out that the intelligence level of the NTID student population is average or above. Thus we find a circumstance of high native intelligence, but because of factors associated with deafness, low achievement and a limited base of career information. This circumstance presents a challange to the educator at NTID; to input information into minds in a way to raise both achievement an aspiration levels and in so doing open doors to employment for the young deaf adult that will enable him to be a productive worker and citizen.

When one looks at the employment history of the deaf he discovers a history of unemployment and underemployment. The typical deaf person lacks job satisfaction, is frustrated and is caught in a job trap. History also indicates that there have been limited opportunities for technical education that provide deaf people with skills necessary for entry level jobs and occupational mobility. The National Technical Institute for the Deaf provides the young deaf adult with

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educational and training and support services so that he can become technically and socially competent go as to enter and progress within the world of work. In addition, deaf students are provided with experiences that will enable them become active participants in their respective communities.

The NTID system must be process-oriented. This means that in organizing the system the relationship between the distinctiveness of the students and simultaneously the needs of the greater society that the student is being prepared for must be understood. The education system then prepares the young deaf adult to be technically and socially competent upon completion of a career oriented study program. Because of the uniqueness of the clientele individualized programs of study are designed.

There are certain requirements of an educational system when one understands the uniqueness of the clientele will move upon completion of a career oriented study program. Specifically, in developing educational and training programs one must understand the needs and demands of business, industry and other sources of employment. A series of flexible educational program are designed and available for deaf students at NTID. These programs provided multiple exit points with each exit point providing the student with significant technical and social competecies required for job entry and mobility. The technical education programs are developed based upon input from business and industry, relative to what they perceive as the technical and social competencies required for job entry and mobility. Examples of input used in curriculum develpment and modification include feedback on student adjustment to the cooperative work experience. Follow-up is also conducted on the adustment of graduates to the work situation. Personal contact is maintained with supervisory personnel to obtain information relative to the work adjustment of the deaf student and graduate. In addition, curriculum planners at NTID remain up-to-date with publications of the government and professional organizations in developing study programs. Curriculum advisory committees also assist in providing input to program planners.

In addition to the educational responsibilities job placement is an integral component of the NTID system. Accountability for placement is built into the system. Thus, every member of the NTID system, including the student, directs his attention to job placement.

We will now turn our attention to selection of students for NTID programs. Deaf students are selected for NTID programs based upon a complete comprehensive evaluation of each student's potential for successfully completing a program of study which will develop employable skills. There is a need

at the entry level for information about the students so that an appropriate program of study can be developed and support service allocated. Information included as part of the admission process includes a review of medical, psychological, and audiologic records; an analysis of a academic achievement and school progress reports; recommendations from vocational rehabilitation and school personnel and others acquainted with the student. Personal interviews by appropriate staff members are held whenever possible. In addition continued liaison is maintained with many publics so that the NTID program is understood and young people who appear able to benefit from NTID encouraged to apply for admission.

Once admitted, approximately 90% of the students enter directly into Vestibule Programs. Vestibule Programs are broad in scope, highly flexible, variable length, and are directed to meet the needs of individual students. They include an individual student evaluation and diagnosis in terms of mathematics, science, language, skills and interests. Remedial programs in reading, language, mathematics and science are developed based upon an analysis of a students strengths and weaknesses. In addition, a sampling program is developed that provides each student with career information, including an understanding of the technical education programs available at NTID and the various employment outlets available for students who pursue particular study programs. Personal development seminars are also offered in the Vestibule Programs. Personal development seminars assist the deaf student in understanding deafness, and in developing of a self concept and understanding how he functions in groups. A program of self governence is also integral to the program. Students are provided with opportunities to assume responsibility for their own behavior.

Vestibule Programs are not terminal but rather prepare students for entry into a terminal career-oriented study program. Vestibule Programs provide the staff and the students with information used to analyze individual student needs, interest, abilities and achievement levels. With this input individualized educational programs are developed for each student and support services allocated to assist each student in moving through his career oriented study program.

The above has described in brief certain aspects of the NTID program. The primary objective of NTID was identified. In addition, the need for NTID to organize as an educational system was spelled out in terms of 1) the unique needs of the clientele and, 2) the history of employment as it relates to deaf people. With this in mind one understands that an educational system must be developed based upon the uniqueness of the clients and the demands of the larger society.

Only upon analysis of the needs of the students combined with the requirements of society can meaningful educational experiences and support services be designed for young deaf people. The National Technical Institute for the Deaf had developed programs that are geared to meet the needs of students and the requirements of the greater society. It is felt that the NTID model has application for other disadvantaged groups and for higher education in general..

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